THE CANADIAN BIRD BANDER'S TRAINING MANUAL : THE INSTRUCTOR'S GUIDE

D. Shepherd, J. McCracken, J. Cappleman, L. Enright, E. Dunn

National Wildlife Research Centre 1999
Canadian Wildlife Service
Environmental Conservation Service

Technical Report Series Number 276

Environment Canada
Environnement Canada

Canadian Wildlife Service
Service canadien de la faune

Canada

Public Works and Government Services Canada
catalogue No.cw69-5/276E
ISBN 0-662-25698-0

Technical Report Series no. 276
Headquarters 1999
Canadian Wildlife Service

Copies of this Technical Report may be obtained from :

Bird Banding Office
Canadian Wildlife Service
National Wildlife Research Centre
100 Gamelin, Hull, Québec
K1A 0H3

100-03995/

TECHNICAL REPORT SERIES
CANADIAN WILDLIFE SERVICE

This series of reports, established in 1986, contains technical and scientific information from projects of the Canadian Wildlife Service. The reports are intended to make available material that either is of interest to a limited audience or is too extensive to be accommodated in scientific journals or in existing CWS series.

Demand for these Technical Reports is usually confined to specialists in the fields concerned. Consequently, they are produced regionally and in small quantities; they can be obtained only from the address given on the back of the title page. However, they are numbered nationally. The recommended citation appears on the title page.

Technical Reports are available in CWS libraries and are listed in the catalogue of the National Library of Canada in scientific libraries across Canada. They are printed in the official language chosen by the author to meet the language preference of the likely audience, with a résumé in the second official language. **To determine whether there is significant demand for making the reports available in the second official language, CWS invites users to specify their official language preference. Requests for Technical Reports in the second official language should be sent to the address on the back of the title page.**

SÉRIE DE RAPPORTS TECHNIQUES DU SERVICE CANADIEN
DE LA FAUNE

Cette série de rapports donnant des informations scientifiques et techniques sur les projets du Service canadien de la faune (SCF) a démarré en 1986. L'objet de ces rapports est de promouvoir la diffusion d'études s'adressant à un public restreint ou trop volumineuses pour paraître dans une revue scientifique ou l'une des séries du SCF.

Ordinairement, seuls les spécialistes des sujets traités demandent ces rapports techniques. Ces documents ne sont donc produits qu'à l'échelon régional et en quantités limitées; ils ne peuvent être obtenus qu'à l'adresse figurant au dos de la page titre. Cependant, leur numérotage est effectué à l'échelle nationale. La citation recommandée apparaît à la page titre.

Ces rapports se trouvent dans les bibliothèques du SCF et figurent aussi dans la liste de la Bibliothèque nationale du Canada utilisée dans les principales bibliothèques scientifiques du Canada. Ils sont publiés dans la langue officielle choisie par l'auteur en fonction du public visé, avec un résumé dans la deuxième langue officielle. **En vue de déterminer si la demande est suffisamment importante pour produire ces rapports dans la deuxième langue officielle, le SCF invite les usagers à lui indiquer leur langue officielle préférée. Il faut envoyer les demandes de rapports techniques dans la deuxième langue officielle à l'adresse indiquée au verso de la page titre.**

SUMMARY

The Instructor's Guide and the companion, *The Canadian Bird Bander's Training Manual* have been designed to complement each other and trainers are strongly encouraged to use both manuals together. They are the result of the collective work of many experienced banders and trainers from Long Point Bird Observatory *. The motivating factors in the production of these two manuals have been to ensure the safety and welfare of the birds involved in any banding project, as well as to ensure that banders are well trained, have well designed projects and that the information gathered is accurate.

The guide emphasizes training procedures as they relate to landbird species. Yet, all bander trainers will find this manual useful in many ways. This guide provides general advice for the trainer and the trainee, suggests the order in which the various banding skills can be taught, provides a series of useful training suggestions, as well as a comprehensive checklist of practical skills. Finally, a report card against which the progress of the trainee can be monitored is included.

Information related to these training manuals, including the list of species being banded under the North American scheme, the band sizes recommended for each species and all the codes to be used for data submission are found in *The North American Bird Banding, Volume 1* (Canadian Wildlife Service, 1991). Information on ageing and sexing techniques is found in *The North American Bird Banding Techniques, Volume 2* (Canadian Wildlife Service and U.S. Fish and Wildlife Service, 1977), still distributed to all banders by the Bird Banding Office, but the new Pyle publication (Pyle, P. *Identification Guide to North American Birds, Part 1: Columbidae to Ploceidae*, Slate Creek Press, California, 1997) is now the Bird Banding Office approved reference for ageing and sexing techniques for all Passerines and near Passerines species. Please note that all information about submission of banding schedules has changed and trainees should be encouraged to use Band Manager, the new data entry and management program. The Bird Banding Office ** can provide further information about this computer program.

The Instructor Guide and *The Canadian Bird Bander's Training Manual* were first completed in December 1994. Draft versions of both manuals have been previously distributed throughout North America for use. Since 1994, other training materials for the trainers and the trainees have been initiated for different groups of species (e.g. passerines, raptors, hummingbirds, waterfowl) by the North American Banding Council. Consult the Bird Banding Office for more information. Some other training manuals may already be available for your use.

* Long Point Bird Observatory, Bird Studies Canada, P.O. Box 160, Port Rowan, Ontario, N0E1M0
** Bird Banding Office, Canadian Wildlife Service, 100 Gamelin blvd., Hull , Quebec, K1A 0H3

RÉSUMÉ

Le *Guide de l'instructeur* et le *Manuel canadien de formation pour le baguage des oiseaux* sont complémentaires et nous recommandons aux responsables de formation de les utiliser ensemble. Ces manuels sont le résultat d'efforts collectifs de plusieurs bagueurs d'expérience et de bagueurs instructeurs de Long Point Bird Observatory *. Les facteurs qui ont motivé la préparation des ces manuels sont avant tout la santé et le bien-être des oiseaux capturés pour des projets de baguage, mais aussi le besoin d'avoir des bagueurs bien formés, des projets de recherche justifiés et des données de baguage complètes.

Le *Guide de l'instructeur* porte principalement sur la formation de bagueurs d'espèces Passereaux. Néanmoins, ce guide sera utile à tous les instructeurs quelque soit l'espèce/les espèces d'oiseaux bagués. En effet, on y retrouve toute une série de recommendations générales pour l'instructeur et le bagueur en formation ainsi que des suggestions comment procéder pour enseigner les diverses connaissances et habiletés, incluant une liste des divers apprentissages à maîtriser. A la fin du guide, on propose à l'instructeur un carnet d'évaluation pourqu'il puisse mieux mesurer les progrès accomplis par le bagueur en formation.

D'autres informations complémentaires à ces manuels de formation, incluant la liste complète des espèces baguées en Amérique du Nord, les grandeurs de bagues recommandées pour chacune des espèces, et tous les codes à utiliser dans les rapports de baguage, se retrouvent dans *Le baguage des oiseaux d'Amérique du Nord, Volume 1*(publié par le Service canadien de la faune, 1991). Les information portant sur les techniques pour âger et sexer les espèces d'oiseaux bagués sont incluses dans *Le baguage des oiseaux d'Amérique du Nord, Volume 2* (publié par le Service canadien de faune et le Fish and Wildlife Service des États-Unis, 1977). Le Volume 2 est encore distribué aux bagueurs par le Bureau de baguage des oiseaux mais le nouveau guide de Pyle (Pyle, P., *Identification Guide to North American Birds, Part 1: Columbidae to Ploceidae*, Slate Creek Press, Californie, 1997) est maintenant la référence acceptée par le Bureau de baguage pour âger et sexer tous les passereaux et autre espèces proches. Veuillez noter aussi que l'information concernant la soumission des rapports de baguage a changé et que les bagueurs en formation devront être informés d'utiliser Band Manager, le nouveau logiciel pour soumettre et gérer les données de baguage. Le Bureau de baguage des oiseaux ** pourra fournir des informations supplémentaires sur ce programme sur demande.

Le *Guide de l'instructeur* et le *Manuel canadien de formation des bagueurs d'oiseaux* ont été complétés en décembre 1994. Les ébauches de ces deux manuels ont été distribuées depuis lors pour de la formation un peu partout en Amérique du Nord. De plus, depuis 1994, grâce à l'initiative du North American Banding Council (NABC), d'autres manuels de formation pour divers groupes d'oiseaux bagués (incluant les passereaux, les oiseaux mouches, les rapaces et la sauvagine) ont été mis en oeuvre. Consultez le Bureau de baguage des oiseaux pour plus d'information.

* Long Point Bird Observatory,c.p.160, Port Rowan, Ontario, N0E 1M0

** Bureau de baguage des oiseaux, Service canadien de la faune, 100 boul. Gamelin, Hull, Qc, K1A 0H3

TABLE OF CONTENTS

ACKNOWLEDGEMENTS 1

INTRODUCTION 2

GENERAL ADVICE 3

ORDER OF TRAINING 5

EVALUATING THE TRAINEE 6

BACKGROUND MATERIAL TO COVER 6
- Ethics of Banding Birds 6
- How Bird Banding Fits into Scientific Studies 8

CHECKLIST OF PRACTICAL SKILLS 9
- PROCESSING 9
  - Identification and handling 9
  - Banding 12
  - Storing/carrying birds 15
  - Field data collection 17
  - Biometrics (Measurements) 19
  - Ageing and sexing 21
- MIST NETTING 25
  - Erecting, opening and closing nets 25
  - Extraction 29
- TRAPS 32
- NESTLINGS 34
- ETHICS AND INJURIES 34
- HEALTH AND SAFETY OF BANDERS 36
- DATA MANAGEMENT 37
- PUBLIC RELATIONS 39

APPENDIX A - CASE STUDIES 40

APPENDIX B - TRAINEE'S REPORT CARD 41

ACKNOWLEDGEMENTS

The concept for this guide was developed by Ian Spence and co-workers in Britain. We have taken Ian's comprehensive framework and adapted it for the Canadian scene. In terms of coverage and organization alone, Ian's contribution has been invaluable, and we heartily thank Ian Spence, Ken Green, Richard Groves, Iolo Lloyd, Adrienne Stratford and Reg Thorpe for making it available to us.

We would like to thank everyone who provided suggestions for the approach, organization and content of these guides, especially Ellen Hayakawa, Peter Blancher, David Hussell, and Lucie Métras (Canadian Wildlife Service). Hilary Pittel, a professional bird rehabilitator, shared many of her insights. Thanks also to Michael Bradstreet, David Brewer, Douglas Collister, Brenda Dale, Mark Dugdale, John Pollock, Paul Prior and George Wallace for their insights and helpful comments. Last but not least, these guides are very much the product of many years of collective experience on the part of all the banders and trainees at Long Point Bird Observatory.

These guides were prepared under contract from the Canadian Wildlife Service to Long Point Bird Observatory, and were funded through the Environmental Citizenship Program of the Department of the Environment.

INTRODUCTION

The purpose of having a bander training program is to, without great expense, produce well-trained banders with excellent projects contributing to the knowledge required for conservation and protection of birds. This bander training guide has been compiled to assist you, the trainer, in various aspects of the training procedure as it relates to landbirds, particularly songbirds. Other training materials are available from the Banding Office for waterfowl banders, and will be developed as necessary for other groups of birds. Still, this guide should be helpful to all trainers, regardless of the target species.

Although the clear emphasis is on training people so that they can qualify for a Subpermit or Master Permit, there is also often a need for training less-qualified helpers at a banding station (see Appendix A). In any case, the manual is designed to guide you in three ways. First, it provides an overall framework for training banders, including a suggested order in which the main elements of the banding procedure may be presented. Second, under specific headings, there are a number of useful suggestions, tips and reminders to the trainer. Last, it provides a comprehensive checklist and report card against which the progress of the trainee can be monitored.

Trainers are strongly encouraged to use this manual in conjunction with *The Canadian Bander's Study Guide*. You may well have useful training tips and reminders that we have overlooked in this guide. Feel free to use them, and better yet, let the Banding Office know what they are so that the guide can evolve.

Training bird banders can have its moments of frustration and heartbreak, but more often than not, it is rewarding and refreshing. A good trainer will invariably have his/her eyes opened by trainees. Such refreshment can be exhilarating, and really does help keep good banders' standards in shape. Hence, we encourage any skilled and knowledgeable bander to take the opportunity to teach others their skills.

The bulk of this manual consists of a checklist of skills. Most of the skills are accompanied by tips on how to teach them, points to look out for when training and thoughts on what level of skill the trainee should achieve. The bare list of skills is repeated as Appendix B, to be used for reference and as a report card for the trainee's progress.

There are many different kinds of banding operations, each of which warrants certain kinds of training and emphasis. Naturally, you should take this into consideration when developing your own training protocol. The specific needs of trainees need to be considered, but you should still give all trainees a broad introduction concerning the basics. This should involve informing the trainee of the variety of techniques and equipment that banders use, not just the system you use yourself. Afterwards, you can concentrate on species likely to be encountered most by the trainee in his/her project and on special techniques for those birds. When appropriate, you can recommend that a banding permit be limited to a certain species or trap type, or issued for use on a specific project only.

GENERAL ADVICE

Not all good banders make good trainers. Quite apart from the fact that it is often surprisingly difficult to explain something that comes as second nature to an experienced bander, there are a number of specific personal qualities which should be focused on and, if necessary, developed. Needless to say, a bander wishing to act in a training capacity should be knowledgeable in, and skilled with most, if not all, the techniques described in *The Canadian Bander's Study Guide*. A trainer should also show confidence, exhibit patience, be unlikely to lose temper in a crisis situation, make honest assessments relating to the trainee, show consistence and humility, be able to explain procedures without being dogmatic, and offer praise and encouragement whenever appropriate.

It is important to bear in mind that banding is part art and part science. While many aspects of the banding procedure can effectively be learned by rote, there are some elements, especially extraction from mist nets and, to a lesser extent, handling, that are more art than science.

Some skills may never be acquired by some trainees. If, after a prudent period of training, you are reasonably certain that a trainee falls into this latter category, explain the situation as kindly as possible, and attempt to dissuade the trainee from further exposure. The trainee may still have a useful role to play in a banding operation and you can use discretion in recommending restriction to traps only, or scribing, weighing and releasing, if appropriate.

Most novice banders are, quite understandably, apprehensive about handling something as delicate as a bird, particularly a small one. And big ones are often a little intimidating. Part of the training process involves increasing the trainee's confidence. Explain that, for the most part, birds are remarkably robust. Demonstrate that the correct approach is to be firm but gentle, and to minimize handling time without jeopardizing safety.

The old adage "practice makes perfect" well applies to bander training, except that perfection is never achieved since even experienced banders continue to learn. This particular point cannot be emphasized too strongly, particularly in a training situation. Complacency can easily set in and result in mistakes. Throughout the training procedure, trainees should be encouraged to make repetitive measurements. This advice will be repeated in the appropriate sections later, but such repetitions and spot checks should **only** be conducted provided that the bird shows no signs of stress. Indeed, if at any stage of training, the trainer perceives that a bird is under stress, the bird should be immediately taken from the trainee, with appropriate conciliatory remarks, and released or treated accordingly. It is best that the trainee is warned that this will probably happen beforehand, in order to reduce anxiety and give the trainee reassurance. For any particular skill, the trainer should also vary the size and types of birds on which repetitions are being performed.

In a similar vein, some trainees, who are otherwise extremely adept in acquiring new skills, can get very frustrated, sometimes even despondent, with a perceived lack of progress. Such people should be strongly encouraged to persist. A useful line of approach is to point out that even highly experienced banders are always learning. By the same token, some trainees exhibit an

uncanny ability and knack for the whole procedure, even though they may know very little about ornithology. Be prepared for all extremes (case studies are given in Appendix A).

From the above, it is obvious that you must evaluate prospective banders at the most basic level and at the earliest stage in their training. Banders need to be physically and emotionally able to conduct the work at hand. Do they have good finger dexterity? Can they see well? Do they have good hand-eye coordination? Do they have good depth perception? Do they have patience? Are they fit enough to survive the rigours of traipsing around the banding area every half hour? Trainers should not be afraid to gauge trainees before admission to a training program, nor to tell them that they have only a limited potential for hands-on work. Most people will gladly accept these basic requirements, and be quite satisfied to help out in other ways, rather than risk harming birds.

In any given banding session, there may well be occasions when training will have to be deferred, such as when there are a lot of birds in a net or when there is a backlog of birds waiting to be banded. Such situations can nevertheless still be valuable training opportunities, because the trainee can observe the trainer in action and learn how to scribe.

Trainees **must** be allowed to proceed at their own speed, but you must be satisfied that the trainee is sufficiently skilled to proceed to the next stage. The speed at which trainees acquire banding skills varies considerably, and you must be alert to such variation.

Training can be speeded up by constantly probing the trainee with questions about what is or should be going on, and also by encouraging the trainee to question you as frequently as is practicable. Questioning should be directed not just towards what is the appropriate course of action but increasingly towards "why" (or "why not"). Such an approach will encourage the trainee to appreciate the whole banding environment and enable more rapid progress towards acquiring the common sense, forethought and awareness that is the hallmark of a good bander.

Even once the basic skills have been mastered, it's a good idea to conduct spot checks on the trainee. Not only does it help assure you that the trainee is continuing to be meticulous, it can also be a big confidence builder for the trainee, providing that the appropriate credit is given. We also suggest many "tests" to see if the trainee has been paying attention. You can do things like loosen net guy ropes or call out incorrect information to see if the trainee picks up on them. Tell trainees that you'll be doing this on occasion after they have learned the basics, so they know they're expected to take the initiative. Misguided polite trainees might otherwise decide to overlook and forgive your "gaffes."

Finally, don't be afraid to make use of your trainees in your research; treat them as if they were full apprentices. They should act as helpful assistants, not as burdens.

ORDER OF TRAINING

The order in which you teach the various skills is entirely up to you. Each trainer will have to tailor the program to the specific situation. However, common sense will tell you that things must progress from teaching the easy skills (e.g. data recording) to the complex (e.g. ageing). The following order of training is patterned after the procedure generally practised at Long Point Bird Observatory, where a variety of capture devices are used and where a large variety of birds is handled.

1) On the first day (or two), the trainee primarily acts in an "observer" role, while all the various elements of the banding procedure (including basic record keeping, ethics and bird safety) are explained. Except during any rapid processing periods, the trainee records the data (i.e. "scribes") and assists in setting, opening and closing nets and traps. As an introduction to the "hands-on" part of banding and to maintain interest, the trainee may be given a few birds in the bander's grip for release. If not already done, the trainee must read the entire *Canadian Bander's Study Guide*.

2) The trainee must begin by mastering bird handling and the various grips, usually with medium-sized docile birds such as White-throated Sparrow or Swainson's Thrush. At this stage, the practical rudiments of ageing, sexing and measuring are introduced, together with practising transferring a bird from hand to hand. The trainee also becomes familiar with placing and removing birds from bird bags and traps. As a prelude to extraction from mist nets, the photographer's grip is introduced and mastered.

3) When it is evident that trainees are comfortable handling medium-sized birds, they may begin to learn simple mist net extraction techniques, again usually on medium-sized birds. The trainer selects untangled, quiet birds as a start and then progressively works up to more difficult situations. Through this entire initial training period, often lasting a week or more, the trainer personally oversees all of the trainee's bandings and extractions. As skills develop, the trainee is permitted to take on more and more solo responsibilities, but is cautioned constantly to come to the trainer immediately should any difficulties arise. As a general guide, the trainee is cautioned **not** to begin extracting a bird if there is any uncertainty as to how it entered the net. Similarly, should any bird take longer than 5 minutes to extract, help must be sought.

4) After a few days, the trainee should be capable of banding small birds, followed by learning to extract small birds. Larger birds can be attempted also, when they occur.

5) Supplementary techniques, such as skulling and moult assessment are dove-tailed into the program as appropriate. As basic skills are mastered, the trainer takes time to discuss scientific applications (if not addressed earlier). As soon as the trainee starts to solo on different elements of the program, the trainer begins making spot checks and testing to see if he/she picks up on deliberate gaffes. At this point, the trainee reads the Study Guide at least one more time.

6) If the trainee wishes to obtain a Master Permit, once all of the field skills are mastered, he/she spends a week or more with the trainer, immersed in completing the various forms, producing banding schedules, data management, and other record-keeping details. Even trainees wishing to obtain a Subpermit should be taken through some of these steps, especially those involving data entry and proofing.

EVALUATING THE TRAINEE

The following material follows the Report Card (see Appendix B) section by section. Some aspects are essential for all banders; others can be ignored if the trainee is only being licensed to work on a special project (e.g. the section on banding nestlings can be ignored if the person is training for a winter study of birds at feeders). Essential aspects are coded with an asterisk on the Report Card.

Exactly how you assess the trainee's skills for any particular element of the program is very much up to your personal judgement, based upon your standards as a Master Permit holder and qualified trainer. When you are satisfied that the trainee has developed skills sufficient to qualify for a permit, you should initial the appropriate cell on the Report Card. The training process concludes with your overall assessment of the trainee's abilities. Hence, the final page of the report card is where you grant your official recommendation as to the candidate's qualifications to hold a certain kind of banding permit. We recommend that the Report Card then be submitted to the Banding Office for consideration, and that both the trainer and trainee keep a photocopy in their personal files. This will facilitate upgrading the trainee's skills in the future.

BACKGROUND MATERIAL TO COVER

Most of the background information to be learned about the administration of the North American banding system is factual and is detailed in the Bird Banding Manuals supplied by the Banding Office. The trainee merely needs to be aware of this material and how to refer to and use the information. However, the Bird Banding Manuals do not address issues surrounding the ethics and humane handling of birds or the scientific merit of banding. This is where you should start things off, but you should always come back to these topics throughout the training program.

1. Ethics of Banding Birds

The importance of understanding and observing the ethics of bird banding cannot be stressed enough. It should be included in every topic of the training program as an element for discussion. Discuss the bander's Code of Ethics with the trainee. Ask the trainee to think of practical situations where ethical questions are raised. For example, find out what the trainee would do in the following situations:

i) A lot of birds are in the netting area. You're only 10 birds away from setting a new world record for number banded in a single day! And it starts to rain.

Close the nets and forget about setting records!

ii) Your friend is a fly-fisherman and has asked you to collect a few crown feathers from Golden-crowned Kinglets.

Politely refuse and explain that it is against the Bander's Code of Ethics.

iii) A farmer asks if he can borrow one of your traps to catch cowbirds and House Sparrows.

Politely refuse and explain that it is against the Bander's Code of Ethics.

iv) A rare bird is captured and you have to keep it on site for a couple of hours in order to let everyone else to see.

Show people as best you can, but a healthy bird should never be kept for more than about an hour. Don't risk harm to a bird for the sake of pleasure pursuits!

v) A "good" bird is captured that you've never banded before, but it takes a size 4 band and you only have size 3B on hand.

All birds are "good" birds. Again, don't risk harm to a bird for the sake of your own pleasure.

vi) A bird refuses to "sit" for a photograph.

An "uncooperative" bird merely wants to be set free. Get the best photo you can within about a minute and then let it go.

vii) A friend of yours has discovered that his nets catch a lot more birds if a couple of House Sparrows are left in them to act as decoys.

Your friend is right in that decoys do work! However, he should be admonished for a serious breach of the Bander's Code of Ethics. Inform him that he is needlessly putting bird welfare at risk, that House Sparrows are indeed birds, and that the Code does not apply only to some species.

viii) Things are really slow. You've had the nets open for 5 hours and have only caught 1 bird, when a friend drops by and invites you out for a quick lunch. Your friend insists that you'll only be gone for an hour at the very most.

Feel free to leave the site, providing that all of the day's banding is done and providing that you close, furl and tie all nets properly before leaving. Ask your friend to help. Don't risk leaving the site untended otherwise. Anything can (and does) happen!

Many situations pertaining to the Bander's Code of Ethics will arise when you are in the field with the trainee. Use such times to make sure that the trainee is able to correctly answer such questions as:

i) When does the condition of a net or trap make its use hazardous to birds? Why?

ii) When should you close nets due to predators? Weather? Excessive catch rate?

iii) How do you deal with an injured bird?

iv) What bander safety hazards are there (e.g. guys not properly marked, pegs in ground that may be tripped over, no facilities for hand-washing)?

v) How can you offer honest, constructive assessment of others' work in a diplomatic way?

2. How Bird Banding Fits into Scientific Studies

Emphasize that banding birds is not a conservation/research program in itself. The government does not have a conservation program called "bird banding," nor does it have researchers looking at data collected from banding. Banders are not making a contribution to research if they are banding birds only for the purpose of contributing to the North American database on banding and recovery.

It is the responsibility of each researcher to ensure that study design, collection and analysis of data are sound, and that the results are published. The Banding Office reviews all applications for permits. If an application is turned down because of lack of scientific merit, then this decision should be respected.

If a trainee is having a hard time deciding on a research topic, emphasize that there are a great many basic questions remaining to be answered about birds. For example, there are many gaps in our knowledge about ageing and sexing, moult strategies, winter site fidelity, and so on. Discuss the range of information that can be collected using bird banding studies. Then discuss the example of a well-designed research project that is given in Appendix C of *The Canadian Bander's Study Guide*. What role did banding play in the study? Can the same kinds of questions be asked for other species?

Pose a question (e.g. Is there a sexual difference in body size of American Goldfinches?) and then ask the trainee to tell you how he/she might design a study to answer it. He/she should be able to explain how ethics were considered in the development of the project design. Discuss

things like sample size and the need to be realistic. Maybe the question could best be answered as part of a cooperative effort with other banders? The trainee should be made aware of the value of cooperative studies like the Monitoring Avian Productivity and Survivorship (MAPS) program and Operation Wingchord.

CHECKLIST OF PRACTICAL SKILLS

The trainer ensures that the trainee . . .

1. PROCESSING

1.1 Identification and handling

1.1.1 *Recognizes all target species and releases a bird unbanded if identification cannot be made with 100% certainty*

A skilled trainee must be able to correctly identify all target species as well as any others that are to be expected in a general banding operation. You can test this proficiency with a bird book or slide quiz, and spot-check it in the field and in-hand. The trainee needs to obtain a passing score of at least 95% for all target species, for a variety of age and sex groups. Some common birds (e.g. female House Sparrow, female Red-winged Blackbird) easily recognized in the field can fool beginning banders when the same bird is in the hand. Hence, test in-hand identification as well as field identification. Also, proper identification can sometimes require taking accurate measurements and wing formulae, so you should introduce these aspects early on in the training process.

Remind trainees constantly that it's OK not to know what species it is and that it's OK to release an unidentified bird unbanded, but that it's **not OK** to guess. As with any serious matter, it's often helpful if you can introduce a bit of levity into the training procedure. Before banding a bird, you can ask for the trainee's opinion on what species it is. Use both simple and difficult to identify species. Once the trainee has identified the bird (whether right or wrong), ask the trainee whether he/she is willing to bet a hundred dollars that the i.d. is correct! Give bonus points to any trainee who not only correctly identifies a bird, but is only 99% certain of the identification and is willing to let it go unbanded.

If the trainee needs to work on identification skills, encourage him/her not to look at colours alone, but to also look at other features (e.g. overall size, patterns of colour, bill shape). Writing a rare bird description, even for a common species, is always a good way to train people to look at the whole bird. Don't restrict the trainee to Peterson and/or the National Geographic guides. Ensure that the trainee is aware of publications such as Prater (for "peeps") and Birds of Canada. When the trainee shows you a bird that cannot

be identified, don't always provide the answer right away. Ask him/her to try to look it up, and help them through the process as if you weren't quite sure either. However, also point out that the bird must be let go if its identity can't be determined within a reasonable amount of time (e.g. within a half hour).

Ensure that trainees can correctly identify feather tracts and anatomical features. Show the trainee how the various feather tracts overlap one another. Test the trainee by covering over the legend to a diagram. A skilled trainee must be able to score 100% on any kind of short test you can create. Again, a useful training exercise is to write a comprehensive rarity report, but using a common bird forces trainees to describe, sketch and label the various features.

Teach the trainee how to properly number flight feathers in a variety of species. The trainee should appreciate that flight feathers are numbered in the order in which they usually moult. The trainee should know the standard total number of primaries (10), secondaries (6), tertials (3) and tail feathers (12) and where to look up departures from this for both passerine and non-passerine species.

1.1.2 *Appreciates the importance of minimizing handling time while not compromising safety*

The trainee must understand this apparent ethical paradox. Simply put, the idea is to process the bird quickly to minimize possible stress, but not so quickly as to get careless and risk injury, or to fail to observe important features of each bird (e.g. for ageing and sexing purposes). Birds should not be held for inordinate amounts of time for photo sessions, to work out identification/age/sex problems, or when giving banding demonstrations to the public.

A skilled trainee must be able to completely process (correctly identify, band, age, sex, measure and release) most birds within 1-2 minutes. Time the trainee's ability to do this on a random sample of 10 birds. If processing routinely takes more than 3 minutes, then considerably more practice is required.

1.1.3 *Uses the bander's grip on a variety of species*

The importance of learning and using the correct grip cannot be overstressed. It is one of the keys to minimising injury. The trainer should check knuckle separation frequently in the early stages of training. Training cannot proceed until the bander's grip has been mastered. Start off teaching this slowly, with only a few birds, preferably outside where there is no risk of injury if an escape occurs and where the trainee can have the satisfaction of releasing the bird.

Most trainees will be quite nervous until they've handled at least several birds, so it is best to give them a "break" after each of these early banding episodes. At this stage in the training, it is critical that you are full of positive comments and encouragement. You

can even go as far as to be complimentary (e.g. "You've got a nice sensitive touch."). Stress too how easy it really is (e.g. "Pretty simple, huh?").

If you want, you could even lead this whole exercise off with having the trainee handle a dead bird that has been frozen and thawed ("freezer specimens"). While this may not be an entirely pleasant experience, it is useful for demonstrating a lot of things over a longer period of time than would be permissable on a single, live bird. For example, freezer specimens are useful for showing which directions legs and wings move and which directions they don't.

1.1.4 *Uses the photographer's grip safely*

Ensure that the trainee holds the fingers tight against the bird's belly to prevent twisting and possible leg breakage. The trainee must be aware that some species are so weak-legged (e.g. goatsuckers and hummingbirds) that they must **never** be held in this grip. Again, repetition is necessary.

1.1.5 *Uses the "ice-cream cone" grip safely*

Teach the trainee this grip, using repetition, and noting for which species it's used and why. Common Grackle is an excellent species that can be used to demonstrate this grip. Make sure that the trainee doesn't grip the bird just by grasping the tail feathers.

1.1.6 *Transfers a bird from hand to hand safely*

This skill should be mastered early in the training program as part of overall familiarity with handling. Its practical uses occur when passing a bird to another person, during extraction and when switching hands to measure or look at the other wing. Here's an area that needs repetition.

1.1.7 *Opens a bird's bill reliably*

The trainee should practice this technique whenever possible until completely mastered, so that when the need for it arises in a "tongued" bird, it is second nature. It should be performed on a wide variety of species, from hard ones like blackbirds down to kinglets. The technique is also required to age certain species (e.g. Gray Catbird).

1.1.8 *Handles a variety of "awkward" species*

Make sure the trainee is able to safely handle species that are very small and have fragile legs (e.g. hummingbirds and kinglets); small and squirmy (e.g. wrens); small and aggressive (e.g. chickadees); have strong feet (e.g. starling, blackbirds); have strong bites (e.g. cardinal, grosbeak); large, vociferous and flappy (e.g. flicker); have dangerous claws (e.g. small hawks, owls), and larger species (if appropriate).

1.1.9 *Releases a variety of species correctly*

Small birds should be released with care via an escape hatch or from an upturned hand. Emphasize how and which improper releases can damage a small bird. Trainees must show confidence when releasing raptors, releasing the wings and tail from the "ice-cream cone" grip, holding the bird into the wind and releasing it up and away. For owls at night, the trainee must show diligence in placing an owl in a safe, dark spot and waiting until it has adjusted and flown away. Explain why this is done. Shorebirds are released by placing them on dry ground near a shoreline. The trainee must be aware of the possibility of leg-cramp in shorebirds.

1.1.10 *Effectively deals with escaped birds in an enclosed space*

Bird escapes do happen, even from the hands of experienced banders. However, the frequency should be very low. If the trainee constantly lets birds loose, then go back to the basics. Teach the trainee to avoid grabbing at an escaping bird (so tail isn't lost or the bird isn't injured by a clumsy grasp). Also teach how to recapture birds that escape in a closed space, pointing out the particular danger that windows present. If the bird cannot be immediately recaptured, the general rule is to open all windows and doors so that it can free itself rather than get hurt against a pane of glass.

1.2 Banding

For the first few birds, it's often a good idea for the trainer and trainee to each have a bird in the hand so that the demonstration can proceed in parallel. It's often easier for the trainee to see what you do, and then mirror your actions, rather than be told. This approach applies to both the banding and measurement procedures.

1.2.1 *Selects correct band size*

The trainee must be aware how to select band sizes in different conditions:

a) Selection according to Bird Banding Manual. Explain which is the preferred size if there is a choice. Encourage the trainee to select the larger choice for ground-feeding birds, to prevent build-up of debris between the band and the leg. Demonstrate the need for different band size according to sex (e.g. Red-winged Blackbird).

b) Selection with a leg gauge. Stress that even in situations where a single band size **only** is recommended by the manual, if the trainee has reason to suspect that it may be a tight fit, the leg **must** be gauged. Have the trainee gauge each bird's leg for the first 10 birds or so. Follow this up on successive days and then spot-check at irregular intervals.

c) Selects a correct band size by eye. Ensure that the trainee is familiar with this technique. Leg gauges don't have a size 0, and gauges can get broken or left behind.

There will also be a transition period with the new band sizes now coming on-stream. Follow up as with leg gauge tracking.

1.2.2 *Reads band numbers correctly*

The trainee must know the number of digits to expect as a step to avoid making errors. Encourage the use of a lens if the trainee has any difficulty with the tiny lettering. If the trainee consistently mis-reads numbers, then there is no point in continuing training in the banding lab. Good eyesight is **essential!** The trainee can, however, still scribe and perhaps remove birds from nets if eyesight is not too problematic. Be on the look-out too for trainees who may be dyslexic and who are liable to scramble numbers.

Does the trainee understand that bands are to be used in sequence, and the fact that they are in sequences of 100, and that a band-size indicator is part of the band number?

1.2.3 *Applies a band correctly*

Band application should be taught with a variety of types of banding pliers, but especially with the kind that the trainee will be working with in his/her project.

When opening a band, the practice of laying the pliers on the table and placing the band over the pins followed by using two hands to open the handles is to be **strongly** discouraged. It is a slow procedure and frequently leads to the band being over-opened and often subsequently deformed. Practice bands should be used if a trainee continues to have problems with this procedure. The pliers should not be set down until after the bird has been banded (and then quietly). Encourage the trainee to close bands holding the index finger **between** the handles of the pliers to prevent sudden movement and overlapping. Ensure that the trainee really cramps the band home during the second squeeze to minimize any gap.

Ensure that the trainee understands the importance of holding the leg to be banded at the tarsal joint. Show how to restrain the other leg too in species that tend to kick a lot (e.g. White-throated Sparrow) or grab your hand (e.g. Common Grackle). Most trainees get a little shaky when banding their first birds. Again, give them frequent "breaks" and provide as much encouragement as you can. If the trainee's hands tremble too much, then offer reassurance (e.g. "Yeah, I get a little nervous sometimes too" or "Too much coffee, huh?"), and gently take the bird away. Have the trainee practise with practice bands, and perhaps practise the bander's grip some more before resuming training. Allow the trainee to calm down and get comfortable with each step before proceeding to the next. Let trainees know that if "the shakes" are pronounced, then it is best to release the bird unbanded or call upon another bander to take over, rather than risk injury. If the shakes are persistent, then the trainer may decide to terminate further hands-on training.

Here are some other useful tips. Throughout the banding operation, the trainer should see to it that the trainee increases his/her speed of processing, to the point where birds are being routinely (and safely) banded in under a minute. Is the trainee in fact making progress? Discourage trainees from talking to birds. Encourage the need for quiet. Some rookie trainees try to "conceal" some of their actions below tabletop level or by holding the bird close to their bodies. Insist that you must be able to see everything that's going on. Make sure that the trainee remains focused on the bird (and all of its limbs) at all times (some trainees have a habit of disregarding where the tail is positioned, sometimes unwittingly pushing it against the tabletop or against their own bodies, causing feather damage). Make sure that the trainee learns not to become distracted at any time while handling birds.

Stress the importance (even virtue) of acknowledging a lack of knowledge, as hiding mistakes and incompetence introduces errors to banding records. Let the trainee in on the fact that even you don't know everything and that you're not afraid to say "I don't know." At the same time, however, look things up in reference manuals to show the trainee that you too are engaged in the learning process.

1.2.4 *Correctly applies a lock-on band (if appropriate)*

Discourage the development of any practice which may lead to scarring the inscription (e.g. using toothed pliers).

1.2.5 *Correctly applies a colour band (if appropriate)*

If the trainee expects to use colour bands subsequent to acquiring a permit, their use should be demonstrated and learned. Cover the range of types available, and the advantages/disadvantages of each. Comment on the need to use colours that don't fade, and that are distinguishable in the field. Point out that colour bands are essentially useless for species that have very short legs (e.g. swallows) or otherwise seldom show their legs (e.g. grebes); and discuss alternative marking methods.

1.2.6 *Recognizes when and how to correct an improperly applied band*

Ensure that the trainee looks for gaps in the bands after each bird is banded. This is true too for retraps, particularly if the band is old. Ensure that the trainee corrects the band on any bird retrapped and found to have mist net strands caught up on the inside of its band.

See that the trainee knows how to use pliers to correct "spiralling." Not infrequently, as a result of poor manufacture or opening the band asymmetrically, when the band is closed around the bird's leg, the two edges of the seam do not meet exactly and there are two sharp "corners" protruding. The band effectively forms part of a spiral rather than a

cylinder. In such cases, the flats on the ends of the pliers are used to correct the band. After this correction, the band may need to be tightened a little.

See that the trainee knows how to use pliers to correct a band about to be overlapped. Demonstrate the use of the flat tips of the banding pliers to bring the two ends level. If overlap has already begun, a pen-knife point may be used to prise the ends apart first.

1.2.7 *Knows when and how to remove a band safely*

Bands that are too tight, are badly overlapped or are too loose should be removed. If one or more digits is, or is about to become, illegible the band should also be replaced. This should also be done if the band has worn so thin that it is effectively a larger size and a danger to the bird. Have samples of such bands on hand (i.e. keep any you have previously taken off) to show the trainee what you're talking about.

Ensure that the trainee recognizes the need for the leg and band to be firmly held at all times during band removal, and that band removal is often a two-person proposition. These techniques are best practised with freezer specimens. It is hoped there will be few opportunities to train with live cases. Hence, and for safety considerations also, it is strongly recommended that freezer specimens be used until the trainer is satisfied that the trainee is competent. Demonstrate and teach how to effect band removal using circlip pliers, thin wire, and the point of a pen-knife.

1.3 Storing/carrying birds

1.3.1 *Uses the appropriate method of storage for particular species*

The placing of raptors, other than small ones, in bags is discouraged. Does the trainee understand why birds are stored? Explain that it helps calm them down and also frees your hands and enables you to carry several birds at once.

The trainee must know which species and what numbers may safely be kept together in one bag/holding box. Stress the value of common sense on this issue. Obviously pecky or grabby species such as vireos and icterids should not be double-bagged. Birds in boxes are less aggressive, but err on the side of caution. Have the trainee put him/herself in the bird's shoes. If you were a Yellow Warbler, would you really want to spend any time at all in close quarters with a grackle? With a Mourning Dove? With a kinglet? None of the above? Why?

The trainee must also show correct judgement regarding how long birds may be kept with respect to feeding habits, weather, onset of darkness, roosting habits, and nesting season. Point out that seed eaters and omnivores may be held longer than insectivores. In general, the latter should be held no more than a half hour. As on many issues,

pragmatism is in order, and any evidence that the time selected is too long must result in a shorter holding time.

Insist that, in cool or foggy weather, processing insectivores must be speeded up. Make sure that the trainee understands that in cold weather, and particularly if fat scores are frequently zero, unless birds are immediately removed from nets and banded, banding should cease or concentrate on seed eaters caught in traps. Note also the value of the bander having warm hands when doing intricate work. Point out the risks of heat exhaustion in birds. Watch the trainee closely for signs of alertness to potential weather hazards. Does the trainee drop everything and close nets at the first sign of an impending rain storm?

The trainee should be aware that, in general, diurnal birds should be released no later than a half hour after sunset. When trapping birds that fly to a communal roost (e.g. swallows), they must be released in time for this ritual. No specific times can be given, but local roost movements should be apparent.

Point out that incubating females (identified by well-developed brood patches) and dependent young must be processed as quickly as possible and returned to the nesting area/family group.

1.3.2 *Places birds in bags and carries and hangs them safely*

Make the trainee aware of the danger of loose threads on the seams of bird bags, ensuring that bags are used inside out. Ensure that the bird is in the bottom of the bag before looping the draw-string, that loops are not tied in knots, and any knots that do occur are untied as soon as they are encountered.

Encourage the trainee to use the free hand to secure the top of the bag around the wrist of the retrieving hand. After removal of a bird, the trainee should check that there are no other birds in the bag and that the hitch is completely undone.

The trainee must carry bags around his/her wrists, binoculars or on a special hanger and **must** be discouraged from developing bad habits such as putting bags on the ground or hanging them on trees. Make the trainee aware of other ways of carrying birds (e.g. two to a hand, paper bags, shirt pocket), but emphasize that these techniques are to be used only rarely and only as very temporary measures.

The trainee must appreciate the reason for spacing out bird bags to permit air circulation. Sorting out smaller birds for earlier processing is also to be encouraged.

1.3.3 *Recommends when bags/boxes need cleaning*

The trainee must be aware of bird health hazards from being exposed to dusty, dried out bird faeces and should recognise when bags and/or boxes need to be cleaned. There are no strict guidelines for this; it is pretty self-evident when something is dirty! The basic requirement is to look for trainees who display initiative to clean bags/boxes, perhaps with a gentle hint from yourself.

1.4 Field data collection

1.4.1 *Records data clearly, legibly and accurately on field sheets*

Emphasize that all data need to be written clearly and legibly. Does the trainee understand why? Naturally, this is important so that other people (including non-banders who may be involved in key-punching data at a later date) can make sense of the records. Emphasize that the records must be able to pass the test of time and should be useful to anyone who comes after the trainee is long gone. Also check that the trainee uses a black pen to enter data on the record sheets and understands that this is because it enables effective photocopying of backup copies of record sheets. Also emphasize that "liquid paper" (not scribbles) is used to make corrections.

Get the trainee accustomed to keeping data sheets clean and dry. Encourage the trainee to keep and use bathroom tissue to clean up bird turd and whatnot on banding sheets as it occurs. Does the trainee understand the value of the data sheets (i.e. that they must be treated like irreplaceable priceless objects)?

You should constantly stress the importance placed on maintaining complete and accurate data. The trainee should be tested regularly throughout the training period. This can be achieved by the trainer calling out incorrect codes and other data when banding and ensuring the trainee picks up on it.

Get trainees accustomed to double-checking band numbers whenever a new series is begun or a retrap is encountered; reading the numbers backwards is a useful way to double-check. Test the trainee by deliberately curbing announcing the band number when banding, or by deliberately mis-reading it.

The trainee should also be made to routinely check the full band number at series changes. Does the trainee ask the bander for this information? Does the trainee ask for missed data and other information? Train and test the trainee by periodically withholding information when banding.

Ensure that the trainee knows and uses correct age, sex, how aged and sexed, species and status codes. Does the trainee double-check all this information or just copy what was

written before? Can the trainee interpret these codes quickly and accurately or does he/she constantly have to look them up or consult you?

For assessing accuracy, the trainer should conduct frequent spot checks at first. With the trainee present, all data should be reviewed by the trainer at regular intervals, and at least at the end of each banding session.

1.4.2 *Recognizes and takes description of and/or photographs rarities or unusual birds*

Show the trainee examples of rarity reports, both good and bad. Can the trainee distinguish between the two? Have the trainee write a convincing "rarity" report for any bird you happen to have on hand, to see if the right information is being picked out. Does the trainee notice deformities or unusual attributes even on common species and make note of these on the banding sheet?

Example A: A Bad Rarity Report

"The bird was white and it had black on its wings, and it looked just like the picture of the Whooping Crane in the book."

Example B: A Better Rarity Report

"On 12 May 1994, I saw a bird that was enormous (nearly 2 metres tall) at Delta Marsh, Manitoba. It was almost all white and looked a lot like a Great Egret — with its very long legs, very long neck, and rather long, narrow bill. However, unlike an egret, its primaries were black. It also flew with its neck outstretched, not tucked in. Its bill wasn't quite as long as a heron's. The bill and legs were dark coloured. I think I could make out a patch of crimson on its face (at base of bill?), but though it was only about 100 metres away, the light was fading. I have no doubt that the bird I saw was a Whooping Crane. I have seen several in winter in Texas, but this was the first I have seen in Canada. Having lived in the Prairies for most of my life, I am very familiar with Sandhill Cranes; this bird was not grey and it was even bigger than a Sandhill. I made the enclosed sketch immediately after the sighting . . ."

1.4.3 *Maintains complete and accurate daily logs*

The trainee should help keep daily records of net and trap open/close times, mesh sizes and net lengths involved, net locations, weather conditions, and so on. A tabulation of the day's banding results is often useful too, as is a short written narrative outlining the day's activities. Does the trainee show an awareness for the importance of such records? Does he/she keep track of such things in a notebook so that the logbook can be correctly filled in? You should naturally set a good example.

1.5 Biometrics (Measurements)

1.5.1 *Uses and accurately reads measuring devices (wing rule, balances, callipers, dividers)*

a) Wing rule: The trainee should be able to repeat measurements consistently on the same wing to within ± 1 mm, and to within ± 1 mm of measurement made by the trainer. There is a common error among beginners using wing rules with a highlighted intermediate 5 mm mark, where the intermediate is mistaken for a 10 mm mark. This should be looked out for and corrected at an early stage. Spot-check all wing measurements at very regular intervals. When the trainee is scribing, you can also deliberately feed the trainee wrong wing chord measurements to test whether the trainee is developing a sense for the range of wing chords for different species.

b) Balances: Introduce the trainee to a variety of weighing devices (i.e. triple-beam balance, Pesola scales, electronic scales). Ensure that the trainee gets into the habit of taring the weighing cones at the start of each day's banding if a self-taring balance is not being used. Many trainees spend inordinate amounts of time when using a triple-beam balance. Show them how to dampen the balance pointer with one hand while the other adjusts the weights. Some triple-beam balances permit interpolation. This should be encouraged providing it is done accurately. As for wing chord, you can also deliberately feed the trainee wrong body weights as a test of growing awareness.

c) Vernier and/or dial callipers: Dial callipers are relatively easy to use, but they are expensive. Many banders still use vernier callipers, and they can pose considerable problems for novice users. In such a case, the trainee should be made to practice on inanimate objects (a ruler is an ideal starter!) until the skill has been acquired. As with wing rules, some people misread the 5 mm intermediate mark, if present. This should be looked for and corrected if necessary. Again, spot-check all measurements regularly.

d) Dividers: A number of measurements, such as culmen and tarsus are more easily done with dividers. Also, some people crush things with callipers, especially stiff ones, so you might generally encourage the use of dividers for measuring delicate skulls and eggs. The trainee should be encouraged to approach the bird from the side when using dividers, partly to prevent puncturing the bird from a sudden movement and partly because measuring is easier that way. Again, conduct frequent spot-checks.

1.5.2 *Correctly and accurately measures various anatomical features*

a) Wing chord: Ensure that the trainee is absolutely clear on what method is required, and that they are indeed measuring the natural wing chord. Most trainees tend to flatten and sometimes straighten wings. Encourage the trainee to tilt the wing to reduce friction. The trainee should be alert to wings that are unnaturally bent following containment in a bird bag. The trainee should also recognize a wing point that is abraded or otherwise damaged, and be prepared to switch to the other wing if its point is intact. If it too is

abraded, growing or broken, does the trainee correctly assess the situation and understand why the measurement is invalid/erroneous and therefore not worth taking?

b) Tail length: The trainee may find the reverse grip easier for learning this technique. As with wing length, repeat measurements should be done until a ± 1 mm accuracy can be achieved consistently. Freezer specimens can readily be used in the learning process. Trainees should learn to use a variety of instruments, but should find a stopless ruler the easiest.

c) Tail difference: The trainee should be cautioned to look out for abrasion which will modify the reading. In such cases, the measurement can still be useful. For example, if the difference between abraded outers and unabraded inners in a forked tail still exceeds the criterion, the character is still valid.

d) Bill, tarsus, crown patch, hind claw, and footpad: The trainee must be aware of the various categories of measurement, and be alert as to which is required in a particular situation. Freezer specimens may again be used profitably for practice. Accuracy of bill measurements for small birds should be under 0.5 mm. Conduct regular spot-checks.

1.5.3 *Assesses simple wing formulae*

This can be attempted once the trainee has learned the numbering nomenclature and the number of primaries and secondaries to expect in a species (or where to look it up). The trainee should be able to identify and measure emarginated primaries. The trainee should be aware that wing formulae are not infallible and that some species will occasionally show aberrant features (e.g. Traill's Flycatcher with an emarginated 6th primary). The trainee should begin with easy examples and progress to harder species such as Warbling and Philadelphia vireos. The trainee needs to be able to find, number and measure the longest primary. Ensure that the trainee checks to see that the primaries around the wing point are full-grown. When teaching how to compare relative lengths of selected primaries, this technique is best learned with repeat measurements (on freezer specimens, if available). The trainee's efforts should be cross-checked with yours and an accuracy of ± 1 mm should be attained.

Practice on freezer specimens may be beneficial and will cut down on time-consuming practice with live specimens.

1.5.4 *Assesses and records moult accurately on a moult card*

Because of the time involved, particularly with novices, it is recommended that trainees begin with robust species (e.g. blackbirds and sparrows) before progressing to smaller insectivores. Freezer specimens are not suitable for practice on moult study as it is very difficult to see the base of the feathers. Trainees should be especially alert to missing

feathers. Do they have to be prompted for moult information, or do they routinely check for it and call it out?

1.5.5 *Accurately scores fat deposits*

Scoring fat deposits is relatively easy, but some beginners, especially older ones, have difficulty in blowing the feathers aside. Take care to prevent trainees hyperventilating. Show them how and where to direct their breath. Take the bird from them after, say, four attempts on the same bird. Encourage the trainee to check the underwing and around the vent for fat, too, especially on birds with little or no fat in the furculum. Spot-checking is required for the first several dozen birds at least.

1.6 Ageing and sexing

1.6.1 *Correctly uses guides for ageing and sexing*

The apparent colour of a feather tract depends both on the light direction and the angle from which it is viewed. This can pose problems when training banders to age and sex. For any given situation, ensure that the trainee comprehends exactly what they are supposed to be seeing. As a help, it is recommended that a progression be followed, whereby initially the trainer holds and explains, then the trainee holds while the trainer explains and finally the trainee holds and explains. Another useful progression to follow relates to characters. Begin with a species that is easy to sex by plumage, then species that are easy to age by plumage and gradually move on to more difficult situations.

At all times, stress that "unknown" is a completely acceptable age/sex determination, even if it appears to be precluded in the manual. It is much better to record something as unknown, than to guess. The trainee must appreciate that there can and will be times when wet plumage, abrasion or some other factor (including inexperience) will make reliable age/sex determinations impossible. Also, stress the fact that there may be a lot of individual variation in many species of birds, especially in the fall.

Stress which age/sex guides contain "reliable" features (e.g. Bird Banding Manual, Woods) and which contain "useful" features (e.g. Pyle *et al.*) and explain the difference (e.g. reliable features have been shown to age/sex birds with 95% accuracy). Note how "useful" features should not be used alone, but rather in conjunction with others, pointing out how such features can often contradict one another. Also, discuss how "useful" features are frequently comparative gradations (e.g. "narrower than", "brighter than"), which means that there is apt to be considerable overlap and that gradations are difficult to interpret without a lot of experience with the species in question.

When using the Bird Banding Manual, does the trainee know how to use a dichotomous key? Does the trainee understand what the back-slash (e.g. HY/SY) means? Does the trainee understand how to use the seasonal graphics for helping decide acceptable age/sex

codes? Does the trainee understand that the Bird Banding Manual is currently the most accepted source for age/sex determinations, and that other references need only be consulted if the species isn't covered in the Bird Banding Manual, or if further information is required/desired?

The trainee should be aware that for particular species, other texts may be appropriate. These include Roberts (1955) and Godfrey (1986). For Holarctic species, Svensson (1992), Prater *et al.* (1977) and Birds of the Western Palaearctic (Cramp *et al.* 1977) can occasionally be very useful. Also, age/sex articles regularly appear in some journals, especially North American Bird Bander and the Journal of Field Ornithology. Encourage all trainees (especially those aiming for Master Permits) to subscribe to both of these journals. Experienced banders keep a binder full of these updates on hand; your trainee should be encouraged to photocopy your set if he/she will find it useful later on.

Encourage the trainee to make note of apparent exceptions or contradictions in the age/sex manuals. If warranted, these notes may be entered into the manuals themselves (in pencil, dated and signed); more frequently they are entered in the comments section of the banding sheet.

Does the trainee know the difference between basic and alternate plumages? Does the trainee understand that the first edition of Pyle *et al.* is to be used as a helpful guide only? Does the trainee understand that while Wood is not very detailed and has its share of problems, its age and sex determinations are acceptable by the Banding Office? A good sign that trainees are experiencing difficulty in learning the information presented in age/sex manuals is when they constantly need to refer to the keys for species they've handled many times.

1.6.2 *Accurately scores skull ossification*

This is probably the most difficult technique to learn, stemming from the fact that many trainees do not know exactly what they are looking for and that it is simply hard to see. If possible, use a couple of warmed up freezer specimens to demonstrate. The skin on the skull can easily be split and pared back. The degree of ossification is then clearly visible. On live birds, it is best to begin demonstrations with thin-skinned species, with an obvious dividing line between ossified and unossified sections. Encourage the trainee to use a lens in good light, out-of-doors if necessary. Also encourage the trainee to look for dots (or absence of them) on "trace" or fully-ossified skulls, rather than make a judgement call based on the colour of the skull. Explain that skull colour alone is not what is being looked at, but rather areas of contrast between ossified and unossified areas.

Discuss equipment that helps (water, lamp with strong diffuse light to reduce glare, lens set on a support stand so hands are free, jeweler's lens). One trick that helps with thick-skinned (e.g. blackbirds) or dark-skinned (e.g. chickadees) or moulting birds is to bring the loose skin of the back of the neck up to the skull region. This skin is often quite

transparent and lacks pigment. The neck skin is also less likely to have "dandruff" or have a lot of pin feathers if the bird is undergoing a body moult. While the training should begin with birds that are easily skulled, your final evaluation needs to include hard-to-skull examples too.

Discourage guesswork! Spot-checking is an absolute necessity for many dozens of skulls. For many species, you may be able to age the bird yourself by glancing at its plumage or some other obvious feature, without having to actually take the time to skull each and every one yourself. Still, you must check the trainee out on scoring.

1.6.3 *Correctly uses other characteristics for age determination*

a) Juvenal plumage. Encourage the trainee to look for the loose feathering of juveniles, especially on the nape, belly and crissum.

b) Moult and differing feather generations. The trainee should comprehend the confusing terminology in different manuals (e.g. pre-alternate and prebasic versus post-breeding and post-juvenile). An understanding of moult sequence should include partial post-juvenile and complete post-breeding adult moult as well as the numerical sequence of moult in flight feathers. A "calendar" of typical events in a bird's life can be prepared in relation to moult sequences. A moult key could even be sketched out. Have the trainee explain various moult strategies to you. Teach the trainee how to recognize different generations of feathers by shape, colour and abrasion. Colour is particularly important in primary and secondary coverts, whereas shape and abrasion are most useful on flight feathers. Ensure that the trainee understands how these features can provide important clues about a bird's age. Encourage the trainee to make comparisons in good light. Contrasts in the primary and secondary coverts are best observed when the wing is almost closed, removing any transparency to the feathers. The trainee should recognize true (as opposed to adventitious) moult. Explain how birds can sometimes lose feathers but not be moulting, and hence the need to check each wing and both halves of the tail, especially if moult seems at all strange. Explain typical moult sequences and the differences between partial, incomplete and complete moults and how a knowledge of these can be used to age birds.

c) Fault bars. Ensure that the trainee is aware that bars have to be uniform across feather tracts in young birds. Caution against mis-identifying an adult tail that is regrowing after complete accidental loss.

d) Feather abrasion (wing and tail). Ensure that the trainee is aware of the faster rate of abrasion (especially of the tail) in ground feeding birds, and that the first two tail feathers are generally more abraded because they are on top and therefore more exposed. Discuss the relative wear of feathers according to pigment (e.g. white feathers are weaker than black feathers).

e) Shape of tail feathers. This skill can be quite difficult to acquire, even for an experienced bander, but you should at least touch upon it. Ensure that the trainee looks at the tangent at the turning point on the inner web and not the feather tip itself, and at the width of the inner web as well. The trainee should also be aware of the effect of abrasion on tail shape, especially in spring and particularly on feathers with pale edging (e.g. adult Black-capped Chickadee). Encourage the trainee to assess more than one feather in case a feather has been lost and regrown in an adult shape. Does the trainee understand that HY/SY birds tend to have "pointier" feathers, not because of feather wear, but because that's how they are constructed? Make certain that the trainee demonstrates full awareness that feather shape must be used with caution, and only in combination with other characters. It must not replace other more reliable methods of age determination (e.g. skulling).

f) Eye colour. Encourage the trainee to look for this character in good light, preferably sunlight. Use of a lens is often helpful.

g) Mouth colour and gape. Explain how the colour of the inside lower mandible is always paler due to the tongue and throat lining, and that the upper mandible colour is what should be checked. Make sure the trainee can distinguish a juvenile's fleshy gape. Ensure that caution is exercised when using a gape mark for ageing, especially in finches and thrushes.

1.6.4 *Understands and assigns correct age codes*

The main point to get across is that age is treated on a **calendar year** basis. Consequently, all birds have a birthday on 1st January. This will help in resolving how to handle an apparent choice (e.g. HY/SY) in a manual. Some trainees have difficulty with the implied equivalence in age codes (e.g AHY is second year or older, or alternatively **not** hatching year). Sketch out a "calendar" for the trainee, showing how a bird's age changes with the changing calendar years. An example is provided below.

YEAR #1		YEAR #2	YEAR #3	YEAR #4
JUNE	JULY to 31 DEC	1 JAN to 31 DEC	1 JAN to 31 DEC	1 JAN to 31 DEC
L	HY	AHY/SY	AHY/ASY	AHY/ATY

Does the trainee appreciate when age and/or sex should be recorded as unknown? Does the trainee guess? Does the trainee understand the consequences of such guesswork? You can test the trainee orally by asking questions like:

i) What age is a bird that has an apparent brood patch and a trace skull?

Answer: HY. The apparent brood patch is really the bare belly of a juvenile. When in doubt, go with what the skull tells you.

ii) What age should be given to a bird that is captured on 21 September 1995 with a trace skull?
Answer: HY.
iii) What age should be given if exactly the same bird is recaptured on 2 January 1996, but its skull is fully ossified?
Answer: The HY bird had a birthday on 1 January, so it must be AHY, and more precisely a SY.

1.6.5 *Correctly uses colour, size, brood patch, and cloacal protuberance for sex determination:*

Colour: Have the trainee name 10 species that can and cannot be sexed by plumage colour. Caution that AHY/ASY females and HY/SY males can often be difficult to separate in some species.

Size: Have the trainee name 5 species that can and cannot be sexed by wing chord. Does the trainee understand the concept of "overlap" and bimodal curves?

Brood patch: Ensure that the trainee can distinguish a brood patch from sparsely feathered bellies seen in juvenal plumage and during moult. Encourage the trainee to look for the "pink and crinkly" appearance of a true brood patch, not just a bare belly. The trainee must be aware that the males of some species can develop partial brood patches, and care must be taken when sexing these species using this technique. Why can't this technique be used for cowbirds?

Cloacal protuberance: The trainee should realize that females in the breeding season can often show a swelling in the cloacal region. Encourage the trainee to look closely at potential protuberances to ensure that they have the typical bulbous appearance before being sexed as male. Does the trainee understand that the **absence** of a brood patch or cloacal protuberance means nothing?

2. SPECIAL AUTHORIZATION FOR MIST NETTING

2.1 Erecting, opening and closing nets

2.1.1 *Chooses an appropriate netting site and appropriate net*

After demonstrating various existing net sites and explaining the reasons for their existence, get the trainee to pick potential new sites and explain why they might be good. A netting site is selected based upon likely bird movements, paying equal attention to sun

and wind exposure, habitat structure and the time required to conduct a net round. This ability is essentially intuitive, but can be learned with demonstrations and experience.

The trainee must appreciate the value of background and vegetation height considerations in terms of net visibility, and hence, efficiency. The trainee must also understand the effect of sunlight on catchability, safety concerns of birds in the net and the durability of the net itself. Introduce the trainee, preferably with examples, to one- and two-panel nets, for use either in specific sites or to target certain species. Discuss, and if possible demonstrate, canopy nets.

For some target species, wind is often inevitable, but a properly set net is safe and effective in moderate wind. Light wind can even be an advantage at times by keeping birds low and making them easier to drive into the wind (and the net). Nevertheless, the trainee should point out wind-blown nets and take steps either to reduce the problem or to close the nets.

Even-terrain and slope is another consideration. Bumpy ground is a poor situation, with the net too low in some spots or the shelf strings too close together. If possible, demonstrate this with the trainee, actually setting up a net on uneven ground (and then relocating it to a better site). Steep slopes should also be avoided.

Nets can be placed to the sides of trails (animal or human) but never across them, for obvious reasons. Likewise guy ropes should not cross an obvious path where people or animals can trip on them. In populated areas, nets should generally be positioned out of sight, to avoid vandalism and disturbance to captured birds.

The trainee must know which mesh size, height and length to use depending on the situation (habitat, weather and target species). The selection of length and height is relatively easy, but the correct choice of mesh size, and the combination of material, denier and ply is more difficult. The trainee must be aware of the safety considerations involved and the need for an informed choice cannot be over-emphasized. Does the trainee know how to measure mesh size?

2.1.2 *Correctly sets up nets unaided*

There are many things about setting up nets that need to be taught and learned. Ensure that the trainee has mastered all of the following points:

a) An adequate space needs to be cleared all round the net. In addition to dealing with obstructions around the net, the trainee must be alert to potential hazards such as an overhanging branch that could be weighed down with wet snow, or a dead tree nearby that could blow down over the net. Does the trainee show initiative? Make sure that the trainee knows to remove hazards at ground level (e.g. stumps) and at eye level. Again, the trainee must show initiative.

b) Secure guying points need to be chosen or provided. This is extremely important since the collapse of a net is to be avoided at all costs. The net set up should be robust enough to withstand wind gusts and even minor collisions against a pole.

c) Correctly judges guy angles. Many trainees tend to set the guys too steeply, the extra tension from which can lead to pegs pulling out or the guy snapping. Guy string is the cheapest element in the set up — it should not be used sparingly.

d) Assembles loops on pole in correct order. Does the trainee correctly identify the top shelf-string, particularly if it does not have a colour-coded loop? Does the trainee drop loops frequently or take a long time to get them correctly ordered, only to get them mixed up again when putting them on the pole?

e) Selects and ties appropriate knots in guys. This may appear somewhat trivial, but the trainee must understand the importance of knots that are easy to tie, especially unaided and with the guy under tension. The knots must also be totally secure yet easy to undo. A tight knot must never be an excuse to postpone making an adjustment to a net for bird safety reasons. The bowline, clove hitch and round turn and two half-hitches should become second nature to the trainee. Have the trainee practice these knots and teach them to others.

f) Pays out net safely, away from ground and side vegetation. Make sure the trainee is always attentive to the need for keeping the net from getting caught on anything.

g) Untwists net avoiding vegetation. Demonstrate the two techniques used for untwisting nets, with the loops in hand and with the loops on a pole.

h) Correctly retrieves shelf string loops that have catapulted through the mesh. This requirement is all too frequently ignored. Not doing it puts an extra strain on the netting around the loop and reduces the amount of bag in the area. It can really foul things up if not attended to properly and immediately. Demonstrate what you mean by deliberately fouling a loop within the net.

i) Sets adequate tension. Show the trainee how to use bird bags to simulate the weight of one big bird or lots of small birds. Show the trainee how a net looks when it doesn't have adequate tension, perhaps by deliberately angling one of the poles. Teach the trainee to check the tension daily, especially with new nets. Does the trainee understand that net tension is important to maximize catch rate and to enhance bird safety? Does the trainee take the initiative to adjust the tension on loose nets? Secretly loosen one and see! If not, point out what you did and remind the trainee that she/he has to take the initiative.

j) Sets correct bag depth. The trainee must learn to test the bag frequently, not only when setting nets, but during the day if the conditions change. Ensure that the trainee uses a bird bag to test the pocket depths. If large species are the target, insist that a bundle of bags of the same approximate weight is used. In an exposed site, make sure the trainee tests the pocket by throwing a bird bag upwind into the net. Does the trainee pull the top shelf-string down properly (by the loop) or improperly (by the thread)? Is a furling pole or makeshift stick used when necessary? Does the trainee reset the net after the top panel has been temporarily lowered? Secretly lower one to find out!

k) Positions bottom panel at safe height. The trainee should be aware that the safe height will vary depending on knowledge of potential local predators and on the height of the ground vegetation. Does he/she test this height?

l) Checks net condition once set up, including making sure that no mesh is caught on the tethering knots. Does the trainee check the net immediately after set up? Is he/she aware of the increased visibility of the top shelf-string and the reduced bag resulting from caught netting? Help set up nets with the trainee for the first few days, then give him/her the responsibility. Then tour the net site together and point out any deficiencies, noting too any good points. Don't always dwell on the negative!

m) Correctly sets up two or more nets with shared poles. Demonstrate how this is done with two people and solo. Mention how it greatly helps if the two nets are of the same type, brand and height. Talk about the advantages of double sets (e.g. fewer net poles is a cheaper and lighter load to carry into the field; fewer guys are required).

2.1.3 *Properly furls and unfurls a net*

Stress the importance of always checking a net **thoroughly** for birds and debris before a net is furled, especially in bad light. Don't let the trainee get away with leaving debris in a net. Demonstrate what a pain it is removing bits of twigs and leaves that have been rolled up in a net. Nets can easily be damaged when they are unfurled with debris caught in them. Does the trainee exercise initiative in this regard, to the point that it becomes an automatic reflex? Does the trainee take a moment to remove debris during each net round, not just when nets are to be furled?

Make sure the trainee learns to tuck net spills near the loops safely back between the shelf strings. Have the trainee master net close-down on day #1. Spot-check for the next few days, pointing out any difficulties. Pay close attention to using ties on the net once it is furled. Teach the trainee good habits early on! Make sure that a furling pole (or makeshift stick) is used to lower high loops.

Ensure that the trainee learns to place the ties behind a shelf string loop for convenient temporary storage. Does the trainee routinely carry around a furling pole or stick in order to raise and lower the top panels of nets?

When nets are to be closed because of a sudden rainstorm, the first priority is to merely close and loosely furl the nets as quickly as possible. Once they are all closed and the rain has let up a bit, they can be revisited later to do a better job.

2.1.4 *Takes in and stores nets and associated equipment properly*

Make sure that loops are tied together properly. Demonstrate your favourite technique and explain the importance of keeping the net free of tangles. Don't just demonstrate; let the trainee take nets down him/herself under your supervision, so that all aspects are learned.

Ensure that the trainee is aware that if the net is wet or even damp when taken down, it should be dried out as soon as possible. What's the reason for labelling? Discuss and define nets that are in poor, good and excellent condition.

Poles and guys should all be retrieved and stored tidily indoors, so they don't get lost, stolen or rotten.

2.2 Operation and Extraction

2.2.1 *Judges how many nets to safely use and checks them frequently and carefully*

The number of nets that can be safely erected depends on distance from banding location, anticipated number of birds, weather conditions, and the number of people on hand. Although this can only come with experience, explain what you are doing and why, right from the beginning, so that judgement will eventually rub off on the trainee. On a busy day, you can test this judgement by suggesting that more nets be opened in order to break last year's record! What is the trainee's response? After a good deal of training, ask the trainee for an opinion of how many nets should be safely opened today, which ones and why. When does he/she think nets should be closed? Does the trainee later take the initiative to close up nets when there are too many birds being caught?

Stress the importance of making frequent (every 20-30 minutes) net checks, to reduce stress on the birds, chances of predation, and bad tangles. Ensure that the trainee understands that nets must be checked more often in hot/cold weather, when the nets are in direct sunshine, when there are visits from the public, when there are lots of birds being captured, and so on. Make net rounds worth looking forward to. Always show your eagerness and anticipation, even on slow days. Test the trainee regularly by waiting for him/her to suggest a net round (provided that the interval does not become excessive).

Stress the importance of making careful (not casual) inspections of each and every net. Pass on the tip that birds in the net may be more obvious when viewed from the end of the net. Most importantly, stress how a small bird (especially one that is caught in the bottom panel or at the furthest end of a net) can easily be overlooked unless the entire

length of the net is **carefully** inspected. It often helps to use the same route so that a net doesn't get forgotten. It also helps to number or name your nets (based on landmarks), so everyone knows which net you might be referring to.

2.2.2 *Demonstrates an astute, accommodating approach to extraction*

The trainee must accompany you for several days and closely watch you, while you carefully explain the logic behind the extraction of each bird. Once the basic grips have been mastered, along with some simple bird banding, it is time to let the trainee have a go at extraction. Whatever you do, don't start off with anything remotely difficult! Inspect and select only those birds that you think you could easily extract in well under 30 seconds. Provide plenty of praise when the trainee makes a successful extraction. As the trainee begins to master easy extractions and gets to the point of removing birds in under a minute, offer progressively more difficult extraction situations. Whenever you see the trainee begin to run into complications or failing to make progress on a particular bird, however, offer a time out while you take over. Insist that the trainee sticks around to watch how you sort out the "difficulty!"

Don't forget that extracting a bird is a one-person proposition — two people trying to work together is seldom very successful. Trainers should remember this and generally try to resist the temptation to physically help the trainee's extractions along. When help is required, simply take over.

It will probably be at least a week before you feel comfortable enough to allow the trainee to make solo net checks. However, it is useful if you give the trainee a bit of "space" prior to that point. For example, you could both work on different birds in the same net, or on different nets in close proximity.

Here are some questions you should ask yourself when assessing a trainee's skill level. Does the trainee check nets irregularly and without careful and close inspection of each net's contents? Take a long time (more than a minute) to extract simple birds? Display ongoing nervousness, awkwardness, roughness or hesitation? Try to extract birds through a net backwards? Nearly get into the net with the bird? Talk to the birds routinely? Want to cut birds out regularly? Cut birds out without permission? Not carry or use a seam-ripper? Get birds more tangled than they were originally? Or not seek help when it is needed? This part of the training program is probably the most subjective to evaluate, but if you answered "Yes" to any of the above questions, then the trainee has not mastered extractions and cannot be graded as being skilled. Any trainee that can routinely extract "simple" birds safely, unassisted, and within about a minute can be considered to be well qualified.

2.2.3 *Extracts a variety of species quickly and safely*

The trainee must be exposed to as many different species as possible. Examples include: small delicate species (e.g. hummingbirds, kinglets); short-winged, wriggly species (e.g. Winter Wren, Common Yellowthroat); strong-clawed species (e.g. Red-winged Blackbird); pecky species (e.g. Black-capped Chickadee); strong biters (e.g. cardinal); long-winged species (swallows); species with "long" carpal joints (e.g. shorebirds); raptors; and any other appropriate species pertinent to the trainee's anticipated project.

It is important that trainees are exposed to as wide a variety of species as possible and become skilled at holding and extracting them. This is true even in specialized operations because non-target species are caught incidentally. Even duck traps regularly catch more than just ducks!

2.2.4 *Deals proficiently with tricky situations*

Only once trainees have mastered routine extractions should they progress to more difficult situations. Make sure that you cover each of these situations thoroughly before allowing a trainee to solo. Teach the trainee when and how to use various aids (e.g. toothpicks, seam rippers, scissors, twigs, nail clippers). Emphasize the need for patience and logic in handling **all** tricky situations. Explain that what often looks like an insoluble mess can often be easily dealt with if you just take a few moments to fully assess things, **before** actually getting to work. It's just like solving a puzzle. There is immense satisfaction in being able to skilfully (almost magically) free a bird that looks badly tangled but really isn't.

Final evaluation should consist of both an oral and practical test. A skilled trainee should be able to answer most or all of your questions concerning how frequently nets should be checked, what to do in case of an emergency, how long should be spent trying to extract a bird before seeking assistance, what to do in different weather conditions (temperature, sun exposure, wind), and so on. A skilled trainee will be able to extract birds in any of the following tricky situations in well under 5 minutes:

a) "Thighed" individual. This is apt to be the most common and simplest situation to handle. Explain that in many cases, it may be best to leave the thighed leg until last.

b) Caught tongue. Ensure that the trainee knows how to use a seam ripper, or failing that a very small twig or grass stem. Make sure that the trainee is supplied with a personal seam-ripper to be carried at all times.

c) Caught carpal joint(s). The trainee must know when it is safe to take a wing right through the mesh, and how to do it.

d) Spun individual (bottom-panel). Explain that the legs may need to be temporarily freed before the bird can be placed in the pencil grip and spun back. Alternatively, the netting can be unwound with the fingers of one hand while the other hand holds the bird stationary. The trainee must realize that the wing that has caused the spinning must be restrained to prevent possible "wing strain" and to stop the bird spinning again.

e) Spun and double-pocketed individual. In this situation, the legs will almost certainly have to be temporarily freed first before proceeding. It may mean working first on one side of the net, then the other, clearing the bird free of one pocket before a "clear belly" can be found.

f) Up and over top shelf string. Insist that the trainee uses a furling pole to lower the top shelf string. Attempts to pull netting down by hand or hold shelf strings down should be **strongly** discouraged. The trainer must ensure that the trainee resets the shelf strings **and** bag correctly after such an event.

g) Up and over an intermediate shelf string. Again, the legs will usually have to be temporarily freed.

h) Round a side string. This can be a real tricky one to figure out. It usually involves working on both sides of the net, sometimes at the same time.

2.2.5 *Recognizes/maintains nets that are in poor condition*

Use an old net (if necessary) to demonstrate what you mean by poor condition (e.g. broken loops, broken shelf strings, many large holes, weak/rotten mesh). Teach the trainee how to maintain nets and do simple repairs. Have him/her make several repairs on small holes. Does the trainee then take the initiative to repair nets? Explain how to properly dispose of a net and why burning is preferable.

3. TRAPS

3.1 *Has knowledge of range of traps and their target species*

Discuss the advantages/disadvantages of the main types of traps, and which is best and under what circumstances. Explain how and why birds are caught in each kind of trap. Make the trainee think. Ask him/her to design a trap for safely catching an ostrich!

Trap choice depends on the target species, prevailing weather and other factors such as tide and wave action.

3.2 *Operates traps properly and safely*

The trainee should know and demonstrate what time schedules are appropriate for checking different types of traps and in various weather conditions. He/she should know the potential dangers of traps (bloody faces from improper mesh size or type, scratches from wire ends, closing doors that hit birds, etc.). If possible and appropriate, have the trainee help you construct a trap.

The trainee must be aware that, while traps may be used in more inclement weather than mist nets, there are limits. In light rain, **only** large traps such as Heligoland and House Traps can be used. In small traps, birds will get wet very quickly from contact with the walls. On the other hand, Heligoland and House Traps should not be used in very strong winds (birds can be blown into the walls), whereas ground traps are permissible.

Does the trainee know how to properly operate and close the trap? Trainees must learn to avoid setting ground traps on bumpy ground, as birds can escape and/or get trapped under the walls and injured. If necessary, build up the site with sand, gravel or snow.

For baited traps, novices tend to use too much bait. Bait should be limited to the trap interior. Some seed dumped in the trapping area can act as an initial encouragement in a newly established trapping site, before a portable trap is put out. Likewise, for larger traps, bait the trap and leave the door open for a day or two to get birds coming to the site. Have the trainee think like a bird. Why does a bird enter a trap? (It's hungry and dumb!) What does it do when a human approaches and how does this flight reaction affect how you approach a trap?

For Heligoland and House Traps, trainees must be aware of the value of placing branches in the ramp area, the role of the grading device inside the catching box, and the need to inspect the trap for any sharp edges. The entrance to the catching box should **never** be left open; self-caught birds are apt to harm themselves or each other if left in the catching box for any length of time.

Point out that not all birds in the area around a Heligoland Trap are expected to be caught, and that there is no need to chase down every single bird. Indeed, concentrating on one individual will often result in several others escaping. Emphasize that birds that break back behind the drivers will often be captured on the next drive, particularly if the banders leave the site by a roundabout route.

Most large traps have catching boxes, into which birds are "herded." A few designs, however, don't use a catch box. Birds are usually taken from these traps by using a dip-net on a pole. This can be a little tricky and requires practice and training in order to do it safely.

Most catching boxes have slotted rubber flaps or sleeves through which birds are removed. Small birds should be enclosed in the bander's grip to protect them. Large birds should be brought out in the reverse grip to prevent flight feathers from being bent backwards and possibly damaged. Don't let large birds bounce on top of small birds in the catching box. Always protect small birds from bigger ones; stress how order of removal is important. For example, if 20 juncos and 1 grackle are in the same catch box, the grackle is removed first. If there are 20 grackles and 1 junco, then the junco is removed first. Does the trainee keep the plexiglass dry and clean? Why is this necessary?

4. NESTLINGS

4.1 *Follows species and date/age guidelines in Banding Manual*

Normally, nestlings occurring in cavity and dome nests are not to be banded (e.g. Bank and Cliff Swallows, Winter Wren and woodpeckers). Does the trainee understand that banding these species usually results in the nest suffering some damage and that such damage is unacceptable?

Is the trainee familiar with the age guidelines? Make sure that she/he is able to age nestlings or estimate their age. The trainee must also be able to assess readiness for banding of nestlings of unknown age. Knowledge of the sequence and growth rate of nestling feathering must be acquired.

4.2 *Approaches nests responsibly and removes, handles, bands and replaces nestlings safely*

The approach should be indirect, with a minimum of disturbance. For treetop nests, a mirror on a pole should be used for checking contents until banding is timely. Make sure that the trainee recognizes signs of parental disturbance and backs off if disturbance can't be limited to about 5 minutes. Is the trainee quick to process nestlings with the least disturbance possible?

5. ETHICS AND INJURIES

5.1 *Knows and practices the Bander's Code of Ethics*

If necessary, have the trainee memorize and recite the Code of Ethics. Keep on driving these ethics home throughout the training period. Point out the professional damage that can result from breaking the spirit and/or letter of any laws (including those regarding transport and possession of wild birds and specimen collection).

The trainee must believe that a zero casualty rate is the correct target. Any sign that the trainee is developing a cavalier or insensitive approach to bird handling must immediately be suppressed. If it persists, then training should be terminated.

5.2 *Shows excellent awareness of injury prevention*

First make sure that the trainee has a comprehensive knowledge of injuries that can occur during banding. Awareness of injury prevention must be demonstrated during capturing, through weather monitoring, and through anticipation of bird numbers and people on hand. For example, the trainee must know when it is necessary to close down traps/nets due to large numbers of birds or deteriorating weather conditions, and come to you for advice on this. There should also be an understanding of which data are most critical to record at times when there is a backlog of birds to be banded. Point out the circumstances when you simply release birds (unbanded) at the net/trap site.

You should emphasize why nesting birds and dependent juveniles must be released in the vicinity of their capture location, and why these birds should be processed as quickly as possible. Show judgement in determining when banding may cause too much disturbance to local breeding birds. Demonstrate an appreciation of the need for balance between disturbance and scientific value of data being collected. Show judgement indicating when an injured or weakened bird should not be banded. Discuss how to deal with predation problems.

Does the trainee suggest innovations, point out potential problems, and take initiative? Review causes of any injuries and point out what steps can be taken to avoid recurrence. The trainer must develop this skill by questioning a trainee when an injury occurs. Diplomacy and sensitivity should be exercised if the casualty is a result of the trainee's actions. Sit down and discuss the occurrence calmly and with reassurance. Keep your cool . . . unless the problem becomes recurrent.

5.3 *Shows familiarity with the most common injuries and their causes*

Ensure that the trainee is able to recognize signs of stress in birds. If the trainee verbally communicates concern about a particular bird's condition, then appreciate the value of this sensitivity. This is also a good time for the trainee to learn how best to handle/treat a bird that is stressed.

5.4 *Demonstrates ability to treat minor injuries*

Can the trainee diagnose common injuries and provide prognoses for recovery? Discuss and demonstrate (as appropriate) before guiding a trainee through treatment processes, and before the trainee is permitted to affect the required treatment.

5.5 *Recognizes and demonstrates the necessity for euthanasia*

Does the trainee understand the circumstances under which euthanasia is necessary and humane (i.e. when a slow and painful death is certain)? While theoretical knowledge will usually have to suffice, euthanasia techniques should at least be demonstrated on freezer specimens. Although rookie trainees should never be allowed to euthanize a bird, advanced trainees should ultimately be required to do so should the occasion arise. But give your trainees fair warning and the chance to opt out. And never show a cavalier attitude towards euthanasia.

5.6 *Assesses whether a specimen is worth preserving*

Any dead bird that is reasonably fresh and in good condition can and should be salvaged as a specimen. Remind trainees of the conditions under which salvage permits are required, and who can legally keep specimens. Does the trainee know what details need to be recorded for specimens? Point out that specimens can be sent to the Canadian Museum of Nature, as explained on the back of your banding permit.

Discuss inappropriate disposal methods and why they are inappropriate.

5.7 *Records details of all injuries and casualties*

Encourage trainees to yield this information as soon as it happens, never to suppress it! If nothing else, the information can be used to prevent any reoccurrences.

You should exhibit noticeable emotional reaction to any injury or casualty. Does the trainee also react sensitively? If not, why not? Be prepared for tears; they are not infrequent. Offer reassurance as necessary, put the casualty into perspective for the benefit of the trainee, and call for a "time out."

6. HEALTH AND SAFETY OF BANDERS

6.1 *Demonstrates a responsible attitude towards potential injuries and diseases from birds*

Quiz the trainee about what risks there are and how these risks can be minimized. Does the trainee heed your advice?

Encourage the trainee to use carbolic or other germicidal soap. Are the trainees hands constantly dirty? Be sure to set a good example yourself!

The trainee should know the symptoms of avian borne diseases. While the risks are small, if any strange illness is contracted, particularly a respiratory one, a doctor should know that bird contact might be involved.

6.2 *Demonstrates a responsible attitude towards physical hazards in the banding area*

Does the trainee take initiative and deal with any potential hazards? For example, are missing guy-line flags replaced? Remove them and find out. Emphasize that you want the trainee to be able to ultimately run your banding operation solo and that he/she must be able to take full responsibility.

7. DATA MANAGEMENT

7.1 *Proofs and corrects banding sheets*

At an advanced level, the trainee should help you proof banding sheets. To help teach and assess proofing abilities, trainers can make up a dummy data sheet that is riddled with common errors (Table 1). The trainee must be able to find, understand and correct all of the mistakes before being recommended for Master Permittee status.

Table 1. An example of a dummy banding "sheet" riddled with errors.

Full Band Number of first band on this sheet: 1910-76101
Location: Hamilton, Ontario

Band # (last 2 digits)	Species	Species Code	Age	Sex	Status	Date	Comments
01	Palm Warbler	PMWA	AHY	M	300	13-10-94	
02	Yellowthroat	YTWA	HY	F	300	13-10-94	
03	Ruby-crowned Kinglet	RCKI	AHY	M	300	13-10-94	
04	Yellow Warbler	YEWA	U	u	300	13-10-94	
05	Black-capped Chickadee	BCCH	AHY	M	300	13-10-94	
06	Ovenbird	OVEN	AHY	U	300	13-10-94	
07	Least Flycatcher	LEFL	AHY	M	301	13-10-94	
08	Alder Flycatcher	ALFL	HY	U	300	13-10-94	
09	Cape May Warbler	CMWA	L	M	300	13-10-94	
10	Black-capped Chickadee	BCCH	ASY	U	300	13-10-94	
11	Tennessee Warbler	TEWA	AHY	M	300	13-09-94	date is correct
12	Ruby-crowned Kinglet	RCKI	HY	U	300	13-10-94	1 red feather on crown
13	Tennessee Warbler	RCKI	AHY	M	300	13-10-94	
14	American Redstart	AMRE	U	M	300	13-10-94	

The following errors appear in Table 1 (listed by band number):

01: Palm Warbler should be recorded as to geographic race (e.g. Western Palm Warbler) and coded appropriately (e.g. WPWA). Also, can't sex this species in fall (should be U).

02: Species name and code don't match (should presumably be Common Yellowthroat and coded as COYE since unknowledgeable scribes are apt to confuse codes used for Common Yellowthroat and Yellow-throated Warbler). Just to be safe, the bander should be asked if any Yellow-throated Warblers were banded! Also, can't sex young female COYE (should be U sex).

03: Can't reliably age RCKI as AHY after 30 September (should be U age).

04: Wrong species code (should be YWAR).

05: Cannot sex BCCH in fall (should be U sex).

06: Should be comment about why the wrong band size was used (e.g. sorry, wrong band size used due to extremely thin tarsus).

07: Should be comment regarding colour band (e.g. red band on left leg).

08: Given the geographic location (southern Ontario), there should be comment regarding how the bird was identified (e.g. identified by wing formula and culmen length); otherwise should be recorded as Traill's Flycatcher (TRFL).

09: Can't have a "local" bird of this species in October (should be aged as HY if skull incompletely ossified).

10: Can't age this species as ASY in fall (should be AHY).

11: No mistakes; suitable comment is made concerning out of sequence banding date.

12: No mistakes: suitable comment is made concerning inability to sex bird.

13: Species name and species code do not agree. This is probably the worst possible of all mistakes! It can usually only be sorted out if wing chord and body weight were recorded (e.g. a large wing and body weight would confirm that it was indeed TEWA). Otherwise, the usual assumption is that TEWA is correct and that the RCKI species code was merely copied mistakenly from the previous line. However, some comment should be made that identification is questionable and that the bird may in fact have been a RCKI.

14: Age is unacceptable; all male AMRE can be aged (comment should be made why the bird was not aged).

7.2 *Completes banding schedules properly and unassisted*

Have advanced trainees assist you with the preparation of your banding schedules, constantly reminding them of the need for accuracy. In order to obtain a Master Permit, a trainee must be able to complete a banding schedule properly and unassisted.

For computerization of banding data, the trainee must be taught how to enter data and how to use the program's various editing subprograms. The SEQCHECK subprogram is used to identify missed or duplicate bands, incorrect change of serial number and date

sequence errors. The BANDEDIT subprogram detects species/age/sex code anomalies and out of range weight and wing chords. Because this latter facility is only as good as the information contained within the AOU.DAT and AGESEX.DAT reference files, the trainee should be encouraged to become familiar with these files and the value of keeping them up-to-date. As a lesson, you can have the trainee enter incorrect information from the dummy banding sheet (Table 1), and then have him/her run this information through the various editing programs, and produce a correct schedule.

Note that the data editing process does not necessarily end when the schedules are submitted. They have yet to be reviewed by the Banding Offices in Canada and the U.S. They may be returned if substantial correction is required. Otherwise, minor errors reported by the Banding Office should be corrected on copy held by the Master Permittee.

7.3 *Handles other paperwork correctly and promptly*

Let the advanced trainee complete band encounter forms, band orders, send in schedules and notes to file and handle queries from the Banding Office, under limited supervision. Point out the need for promptness. Requests for band inventories and other information may also be delegated fruitfully.

8. PUBLIC RELATIONS

8.1 *Communicates effectively with the public about banding*

Ensure that the trainee is aware of the need for good public relations and is aware of some of the potential conflicts that can arise in banding operations that are open to public scrutiny. Encourage the trainee to be sensitive, polite and friendly, even in awkward circumstances when visitors are critical of the operation. However, let the trainee also know how to firmly deal with visitors who may take it upon themselves to interfere with operations (e.g. a visitor who tries to take a bird out of a net).

Talk to visitors and explain what's going on and why. After a while, the trainee should be encouraged to give a banding demonstration with close supervision. Follow up early demonstrations with praise and a few helpful pointers. Later, when you're confident in their abilities, advanced trainees should be allowed to design and give their own demonstrations. Ensure that the Bander's Code of Ethics is not forgotten in the excitement!

8.2 *Communicates effectively using banding data (reports, articles etc.)*

As a start, encourage trainees to write articles for local papers, naturalists' club newsletters, etc. Later, they may be persuaded to write or co-author an article or short paper in the local banding association newsletter, or in North American Bird Bander.

APPENDIX A - CASE STUDIES

The following case studies will give you an idea of the kinds of trainees and skills to expect:

Trainee # 1 (The Ace)

The Ace, surprisingly enough, was originally a complete rookie. She knew virtually nothing about birds upon arrival at the banding station. Yet, in the span of a week, her abilities to learn and absorb everything were remarkably apparent. She constantly asks questions (and learns the answers), comes to us for help, and shows a great deal of sensitivity, initiative and natural bird handling skills. After only 2 months of intensive banding, we would have no trouble in recommending her for a Subpermit, with special authorization for mist netting. She plans to use bird banding as part of her thesis research on age structure of forest birds. She already has mastered many skills that would allow her to become a first-rate bander trainer.

Trainee # 2 (Mr. Average)

Mr. Average is a good solid birder who has been with us for about one month. He is careful, methodical, and has a serious attitude towards ornithology. He plans on using bird banding as part of the research for his thesis on wintering cowbirds. He does not have any serious problems in bird handling or banding, but needs to pay closer attention to the needs of the birds. He is apt to be a bit of a "lister" and can easily get absorbed in the whole marvellous process of being up close to birds he has only dreamed about. This can sometimes mean that birds are held just a little too long in our judgement. But this is a natural phase. He is also apt to be a bit of a "know-it-all" and needs to be gently coaxed into understanding that its OK to admit that he sometimes doesn't in fact know it all. This humility too will also come in time. Still, for the purposes of his thesis, we feel that he is sufficiently qualified to obtain a Subpermit with no special authorizations.

Trainee # 3 (The Scribe)

This trainee is 65 years old and banded birds for about 20 years when he was much younger. We wants to have his banding permit renewed so that he can band birds in his backyard. However, he is in poor physical and emotional health (wears thick glasses and drinks heavily and has clumsy and nervous hands). Formerly, he was a good bander, but he is unwilling/unable to learn new and improved techniques and has little modern regard for bird welfare. Though he still has a passion for birds and for bird banding, his physical and emotional states just aren't up to snuff. He is aware of this, quickly settled into acting as a scribe for the banding operation, and enjoyed just being close to birds. He does not qualify for a banding permit.

APPENDIX B - TRAINEE'S REPORT CARD

Not all categories need to be checked (initialled) for a banding permit. However, some categories are fundamental and need to be assessed for all prospective banders. These are identified by an asterisk. Items with double asterisks are essential elements for prospective Master Permittees.

The trainee can . . .

		Required Items	Trainer's Initial
BACKGROUND MATERIAL			
1. Understand the ethics of banding birds		*	
2. Understand how banding fits into scientific studies		*	
CHECKLIST OF PRACTICAL SKILLS			
1.	**PROCESSING**		
1.1	**Identification and handling**		
1.1.1	Recognize all target species and release a bird unbanded if identification cannot be made with 100% certainty	*	
1.1.2	Appreciate the importance of minimizing handling time while not compromising safety	*	
1.1.3	Use the bander's grip on a variety of species	*	
1.1.4	Use the photographer's grip safely	*	
1.1.5	Use the "ice cream cone" grip safely	*	
1.1.6	Transfer a bird from hand to hand safely	*	
1.1.7	Open a bird's bill reliably	*	
1.1.8	Handle a variety of awkward species	*	
1.1.9	Release a variety of species correctly	*	
1.1.10	Effectively deals with escaped birds in an enclosed space	*	
1.2	**Banding**		
1.2.1	Select correct band size	*	
1.2.2	Read band numbers correctly	*	
1.2.3	Apply a band correctly	*	
1.2.4	Correctly apply a lock-on band (if appropriate)		
1.2.5	Correctly apply a colour band (if appropriate)		

The trainee can . . .

		Required Items	Trainer's Initial
1.2.6	Recognize when and how to correct an improperly applied band	*	
1.2.7	Know when and how to remove a band safely	*	
1.3	**Storing/carrying birds**		
1.3.1	Use the appropriate method of storage for particular species	*	
1.3.2	Place birds in bags and carry and hang them correctly	*	
1.3.3	Recommend when bags/boxes need cleaning	*	
1.4	**Field data collection**		
1.4.1	Record data clearly, legibly and accurately on field sheets	*	
1.4.2	Recognize and take description of and/or photograph rarities or unusual birds	*	
1.4.3	Maintain complete and accurate daily logs	*	
1.5	**Biometrics**		
1.5.1	Use and accurately read measuring devices (wing rule, balances, callipers, dividers)	*	
1.5.2	Correctly and accurately measure various anatomical features	*	
1.5.3	Assess simple wing formulae		
1.5.4	Assess and record moult accurately on a moult card		
1.5.5	Accurately score fat deposits		
1.6	**Ageing and sexing**		
1.6.1	Correctly use guides for ageing and sexing	*	
1.6.2	Accurately score skull ossification		
1.6.3	Correctly use other characteristics for age determination		
1.6.4	Understand and assign correct age codes	*	
1.6.5	Correctly use colour, size, brood patch, and cloacal protuberance for sex determination	*	
2.	**SPECIAL AUTHORIZATION FOR MIST NETTING**		
2.1	**Erecting, opening and closing nets**		
2.1.1	Choose an appropriate netting site and appropriate net		
2.1.2	Correctly set up nets unaided		
2.1.3	Properly furl and unfurl nets		

The trainee can . . .

		Required Items	Trainer's Initial
2.1.4	Take in and store nets and associated equipment properly		
2.2	**Operation and Extraction**		
2.2.1	Judge how many nets to safely use and checks them frequently and carefully		
2.2.2	Demonstrate an astute, accommodating approach to extraction		
2.2.3	Extract a variety of species quickly and safely		
2.2.4	Deal proficiently with tricky situations		
2.2.5	Recognize/maintain nets that are in poor condition		
3.	**TRAPS**		
3.1	Has knowledge of range of traps and their target species		
3.2	Operate traps properly and safely		
4.	**NESTLINGS**		
4.1	Follow species and date/age guidelines in Banding Manual		
4.2	Approach nests responsibly and remove, handle, band and replace nestlings safely		
5.	**ETHICS AND INJURIES**		
5.1	Know and practice the Bander's Code of Ethics	*	
5.2	Show excellent awareness of injury prevention	*	
5.3	Show familiarity with the most common injuries and their causes	*	
5.4	Demonstrate ability to treat minor injuries	*	
5.5	Recognize and demonstrate the necessity for euthanasia	*	
5.6	Assess whether a specimen is worth preserving	*	
5.7	Record details of all injuries and casualties	*	
6.	**HEALTH AND SAFETY OF BANDERS**		
6.1	Demonstrate a responsible attitude towards potential injuries from birds	*	
6.2	Demonstrate a responsible attitude towards physical hazards in the banding area	*	
7.	**DATA MANAGEMENT**		
7.1	Proof and correct banding sheets	**	
7.2	Complete banding schedules properly and unassisted	**	
7.3	Handle other paperwork correctly and promptly	**	

The trainee can . . .

		Required Items	Trainer's Initial
8.	**PUBLIC RELATIONS**		
8.1	Communicate effectively with the public about banding	*	
8.2	Communicate effectively using banding data (reports, articles etc.)	**	
9.	**OTHER SPECIAL AUTHORIZATIONS**		
9.1	Demonstrate proficiency in the following special authorizations (specify):		
10.	**FINAL GRADING**		
10.1	Ethics	*	
10.2	Processing	*	
10.3	Special Authorization for Mist netting		
10.4	Traps		
10.5	Nestlings		
10.6	Injuries to Birds	*	
10.7	Health and Safety of Banders	*	
10.8	Record Keeping	**	
10.9	Public Relations	*	
10.10	Other Special Authorizations (specify):		

TRAINER'S RECOMMENDATIONS

I _____ (name of trainer) have trained and witnessed _____ (name of trainee) and am satisfied that all necessary training has been successfully completed and that he/she qualify for a:

Subpermit ☐

Master permit ☐

to band the following species groups:

waterfowl ☐
seabirds ☐
shorebirds ☐
raptors ☐
landbirds ☐

with the following authorizations:

to use mist nets ☐

to use cannon nets ☐

to use chemicals ☐

to use colour marking ☐

to use radio transmitters ☐

to band endangered species ☐

to take blood samples ☐

Signed: _____ (trainer) Dated: _____

Permit # _____

Special Species or Trapping Restrictions (please list):

Other Comments: